Energy Efficiency – the first fuel for the EU Economy

How to drive new finance for energy efficiency investments

Energy Efficiency
Financial Institutions Group

Part 1: Buildings (Interim Report)

The Energy Efficiency Financial Institutions Group ("EEFIG") was established as a permanent working group by the European Commission, in late 2013, as a result of the dialogue between Directorate-General for Energy ("DG Energy") and United Nations Environment Programme Finance Initiative ("UNEP FI"), as both institutions were engaging with financial institutions to determine how to overcome the well documented challenges inherent to obtaining long-term financing for energy efficiency. EEFIG resulted from the joining of these forces to engage with the sector's stakeholders and financial institutions to create an open dialogue and work platform with the European Commission; and with UNEP FI helping to convene meetings and bring in a variety of active and interested players, among its members and beyond, as per its mission statement of "changing finance, financing change". Founders believe that the creation of EEFIG represents the first time such a dialogue and work platform has been established between the Commission and the financial sector on the topic of energy efficiency finance.

The membership of EEFIG is comprised of 51 individuals drawn from the following organizations:

- Public and private financial institutions (banks, investors, insurers etc.);
- Banking associations and investor groups;
- Energy efficiency industry experts;
- Energy efficiency services representatives;
- Civil society experts representing diverse energy efficiency stakeholder groups;
- European Commission; and
- UNEP FI.

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Energy Efficiency Financial Institution Group Members

EEFIG members have been drawn from the following firms, entities and organizations:

Allianz Real Estate
ASN Bank
Bank Nederlandse Gemeenten (BNG)
BNP Paribas Investment Partners
Buildings Performance Institute Europe (BPIE)
Caisse des Dépôts
Cassa Depositi e Prestiti S.p.A.
CDC Climat
Cecodhas – Housing Europe
Climate Strategy and Partners
Deutsche Bank Group
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Energy Managers Association
EuroACE
EUROBANK ERGASIAS SA
European Association of Public Banks (EAPB)
Hermes Real Estate
Institutional Investors Group on Climate Change (IIGCC)
ING Commercial Banking
KfW Bankengruppe
Netherlands Enterprise Agency (RVO.nl)
NRW.BANK
Royal Institution of Chartered Surveyors (RICS)
Société Générale
Triodos Bank
UniCredit Group
United Nations Environment Programme (UNEP) and its Finance Initiative (UNEP FI).

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Executive Summary

In late 2013, the Energy Efficiency Financial Institutions Group ("EEFIG") was jointly convened by the European Commission and the United Nations Environment Programme Finance Initiative ("UNEP FI") to bring together their experience to address the need to increase the scale of energy efficiency investments across the EU. This is the interim report of EEFIG and represents the consolidated consensus and shared views of its expert members.

Energy Efficiency is of Increasing Strategic Importance for Europe

While energy efficiency investments in buildings have been taking place for decades, the EU today finds itself in a place where these investments have become strategically important due to the high level of energy imports required by the EU bloc (55% in 2012 and costing EUR 400bn), rising energy prices and the need to increase ambition in tackling climate change in 2030[1]. A number of the policies and markets which guide energy efficiency investments are still relatively new and will take time to have their full impact.

EU is at Risk of Missing its Targets unless Energy Efficiency Investments Increase

EEFIG members share the Commission's concerns that insufficient public and private investment is flowing into energy efficiency at present; and that if this trend continues then EU Member States are at risk of missing their 2020 and longer-term energy efficiency targets. EEFIG members see energy efficiency as the first fuel for the EU because it is competitive, cost effective to produce and widely available. Furthermore, EEFIG members agree that energy efficiency investments produce multiple benefits for multiple stakeholders and increase energy security which makes the case for using public funds to blend with private sector investment to address risks and achieve the scale of financing needed. EEFIG believes that to achieve this outcome a historic level of public-private collaboration will be required.

EEFIG Presents Key Recommendations

During the last six months, EEFIG members have worked together in a process containing several steps: a literature review; characterization of the market and rationale for energy efficiency investments in buildings; identification and definition of the key drivers of supply and demand for energy efficiency investments in EU Buildings and prioritization by buildings segment; identification of the tools and approaches required to stimulate energy efficiency investments in buildings and concluding with a set of clear recommendations both to sector stakeholders and policy-makers.

The results of this process can be summarised as follows:

- EEFIG identifies a very strong economic and social rationale for the up-scaling of energy efficiency investments buildings in the EU as well as specific hurdles;
- EEFIG sees a strong economic opportunity for stakeholders, and the need to boost both the drivers of demand and supply of energy efficiency investments across all buildings market segments;
- Whilst there is no single solution, EEFIG identifies a framework of cross-cutting measures as well as individual requirements to support investments for each building market segment;
- In its analysis of the different tools and approaches, EEFIG identifies those which can be led by market stakeholders and those which must be policy led. Both require work in parallel to deliver the targeted increase in energy efficiency investments;
- In conclusion, EEFIG identifies six critical areas requiring policy intervention and from these suggests six specific recommendations to the European Commission.

To address this, EEFIG believes that its policy recommendations can be summarised as: Effective transposition, implementation and enforcement of existing legislation governing the buildings sector connecting to a 2050 vision of EU buildings; Increased focus on, standards and open-source access to all aspects of buildings performance data and investment processes; Increased capture and articulation of the multiple benefits of energy efficiency investments for decision makers and in reporting; and optimal use of Structural and Investment funds 2014-2020, Horizon 2020 and ETS revenues to support new and existing Member States activities to meet their agreed objectives under the Energy Efficiency Directive.

[1] COM (2014) 015 final.

Summary of EEFIG Recommendations

EEFIG has the strong sense that we are at a tipping-point, with energy efficiency investing having the clear potential to emerge into the mainstream as a key driver of EU competitiveness, economic value, innovation and employment across Europe. To achieve the deep energy efficient renovation of buildings in the EU, and deliver the multiple benefits which this brings, policy-makers and market participants need to work together to build upon the successful models which exist - permitting the generalisation and expansion of these models across all of the EU, This collaboration should increase the market drivers and support selected instruments and approaches to scale-up energy efficiency investment activity in all Member States to allow for renovation rates to increase and renovation depth improve in consonance with local, regional and national differences.

Emerging from EEFIG's interim analysis are several key themes which guide its recommendations as outlined in the final chapter of this interim report. These are:

1	**The full benefits[2] of energy efficient refurbishments of buildings must be captured and well-articulated, with evidence, and as a priority, to key financial decision makers (public authorities, buildings owners and managers and for householders)**
	The full benefits of energy efficiency investments (energy and non-energy related) must be identified, measured and presented for each refurbishment in ways in which key financial decision makers can understand and respond to. The reporting and stakeholder frameworks in which key decision makers sit must be required to look more broadly[3] and account for more than just short-term energy savings; The necessary evidence and data must be easy to access and cost effective to compile and assess in investment decision making processes; Energy efficiency investments should be prioritized for key decision makers; Internal procedures, reporting and accounting systems should be adapted so as not to additionally handicap viable energy efficiency investments.
2	**Processes and Standards for Energy Performance Certificates, Energy Codes and their Enforcement need to be strengthened and improved**
	A step change in how energy efficiency potential is identified, measured, reported and verified is needed and achieving this is fundamental to unlocking the market at scale. The feedback from financial institutions and markets participants on the practicality and usefulness of existing energy performance certificates in Member States should be reflected. The rapid and repeated process of connecting this input to improve and strengthen approaches should be a priority, as well as the practical and effective local enforcement of existing regulations, especially minimum performance standards upon upgrade, sale or rental.
3	**Making it easy to get the right data to the right decision makers**
	There are too many hurdles between the relevant and credible data and the decision makers who need it; and the processes and resources required to extract that data and qualify it appear specialist and costly. For energy efficiency investments in buildings to enter the mainstream, it must be as easy for a key property decision maker to understand and value the benefits of those investments as it is for other comparable decisions. This means that adequate,

[2] Meaning Energy Savings, Productivity Increases, Health Benefits, Acoustic Benefits, Social and Environmental Benefits and the many other site specific multiple benefits of energy efficiency. IEA. (2012). *Spreading the Net: The Multiple Benefits of Energy Efficiency Improvements.* Retrieved from: http://www.iea.org/publications/insights/insightpublications/Spreading_the_Net_FINAL.pdf

[3] COM (2011) 681 final.

	accessible, dependable and sortable data on buildings and their real, measured and verified energy performance should be identified and made available to facilitate the preparation of energy efficiency investment cases. The data structures must clearly enable the connection and validation of value increases (in the broadest sense) with energy efficiency investments[4].
4	**Standards should be developed for each element in the energy efficiency investment process**
	The standardization and adoption of best practice, standard national models for: Legal contracts, underwriting processes, procurement procedures, adjudication, measurement, verification, reporting, energy performance (contracts and certificates) and insurance; will add volume to the energy efficiency investment market and lower its costs of finance and transaction costs. The use of standardised measurement, reporting and verification and legal documentation is particularly important to facilitate the bundling of investments for recycling to the bond market.
5	**Priority and appropriate use of EU Structural and Investment Funds ("ESIF") and ETS revenues through public-private financial instruments from 2014-2020 will boost investment volumes and help accelerate the engagement of private sector finance through scaled risk-sharing**
	The scale of finance needed to upgrade the building stock means this cannot be achieved by the private sector alone. As such public finance needs to be targeted to address specific market failures and risk share with the private sector. Scalable models and successful case studies of dedicated credit lines, risk sharing facilities and on-bill repayment schemes abound. Member States should be encouraged to move away from traditional grant funding and look more to identifying the working models which best address the energy efficiency refurbishment investment needs in their buildings (as articulated in their National Buildings Refurbishment Strategies). ESIF 2014-2020 funding (and other sources such as ETS revenues) will be required to kick-start and complement national energy efficiency funds (EED Art 20) and energy supplier obligations (Art 7) to deliver Europe's 2020 targets and National Buildings Renovation Strategies (Art 4).

[4] Bullier, A., Sanchez, T., Le Teno, J. F., Carassus, J., Ernest, D., & Pancrazio, L. (2011). *Assessing green value: A key to investment in sustainable buildings.* Retrieved from: http://www.buildup.eu/sites/default/files/content/Assessing%20Green%20Value%20-%20Bullier,%20Sanchez,%20Le%20Teno,%20Carassus,%20Ernest%20and%20Pacrazio%20-%20ECEEE%202011.pdf

1. Framework

A. Rationale for scaling up Energy Efficiency Investments in Europe

> *"Buildings account for about one-third of the world's energy consumption and global greenhouse gas emissions, and improving energy efficiency in the building sector is a global priority. I am confident that this dialogue with financial institutions will lead to much needed investment of private funds."* – Achim Steiner, Under Secretary-General of the United Nations and Executive Director of UNEP.

Energy Efficiency has been described as the EU's biggest energy resource[5] and one of the most cost effective ways to enhance the security of its energy supply and decrease the emissions of greenhouse gases and other pollutants. This is why the EU has a 20% primary energy consumption saving target for 2020 and further legislation in the field.

In 2011, global energy efficiency investments across all sectors totaled $300bn[6] representing a very significant and growing market opportunity for investors and businesses. As regards buildings, according to the Ceres 2014 report[7], the additional investment required beyond business as usual investment in buildings' energy systems to limit global temperature rises to a 2^0C scenario are up to another $300 billion per annum globally between 2010 and 2020, comparing with an overall investment in buildings of $620 billion per annum for that period. The value added of these energy efficiency investments in buildings is, of course, in energy saved[8] and the impact on building's financial performance[9].

Energy efficiency investments are characterised by their capacity to bring direct energy returns[10], and additional value streams to private owners and asset operators[11,12], as well as significant public benefits in terms of increased employment, lower emissions, increased energy security and reduced dependence on foreign energy imports and improvements to a country's fiscal balance[13]. Europe's Energy Efficiency Plan[14] expects to deliver 2 million jobs, increased industrial competitiveness together with potential annual financial savings estimated at Euro 1,000 per European household and aggregate annual emissions reductions of 740 million tons of CO2e. Enabling more energy efficiency investments also represents a way for financial institutions to have a differentiated product offering to the market and contribute to their own competitiveness as well as giving their clients the financial support they need to assist them in the transition to a low-carbon economy.

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[5] COM 2011 (0109) final.

[6] IEA. (2013). *Energy efficiency market report 2013* [Executive Summary]. Retrieved from: http://www.iea.org/Textbase/npsum/EEMR2013SUM.pdf

[7] CERES. (2014). *Investing in the Clean Trillion: Closing the Clean Energy Investment Gap*. Retrieved from: http://www.ceres.org/resources/reports/investing-in-the-clean-trillion-closing-the-clean-energy-investment-gap/view

[8] BoAML study shows that for every dollar spent on energy efficiency appliances, buildings, equipment and expenditures avoids more than US$2 of investment in electricity supply, and saves up to US$4 in lifetime energy expenditures.

BoAML. (2012). *SRI & Sustainability: Less is more, Global energy efficiency.* Retrieved from: http://about.bankofamerica.com/assets/pdf/SRI-and-Sustainability-030112.pdf

[9] UNEP FI (2014). *Unlocking the energy efficiency retrofit opportunity*. Retrieved from: http://www.unepfi.org/fileadmin/publications/investment/Commercial_Real_Estate.pdf

[10] Ibid

[11] IEA. (2012). *Spreading the Net: The Multiple Benefits of Energy Efficiency Improvements*. Retrieved from: http://www.iea.org/publications/insights/insightpublications/Spreading_the_Net_FINAL.pdf

[12] IIGCC (2013). Protecting value in real estate - Managing investment risks from climate change. Retrieved from: www.iigcc.org/publications/publication/protecting-value-in-real-estate-managing-investment-risks-from-climate-change

[13] Fraunhofer Magazine. (2014). *European Diversity*. Retrieved from: http://www.fraunhofer.de/en/publications/fraunhofer-magazine/magazine_2014/Fraunhofer-magazine_1-2014/magazine_1-2014_32.html

[14] European Commission. (2014). *Energy Efficiency Plan* [Website]. Retrieved from: http://ec.europa.eu/energy/efficiency/action_plan/action_plan_en.htm

Yet, notwithstanding the "win-win" characteristics of energy efficiency investments, present investment flows in energy efficiency are sub-scale. Prominent studies[15] on assessing greenhouse gas mitigation potential agree that the building sector has the largest longer-term, cost-effective saving potential of any industrial sector. Estimates suggest that € 60-100 billion[16] is needed to be invested annually in EU buildings to achieve Europe's 2020 energy efficiency targets yet current investments are below half of these requirements[17].

In 2012, the Energy Efficiency Directive (2012/27/EU) was adopted to help fill the policy gap without which it was expected that the EU would have missed its 2020 energy efficiency targets by some 11%[18]. The Energy Efficiency Directive contains a number of new mechanisms making 2014 a pivotal year as Member States both transpose this Directive into national law and agree the framework for the deployment of European Structural and Investment Funds ("ESIF") for the up-coming programming period 2014-2020. It is commonly noted, and assumed, that for each euro of public funds invested in energy efficiency significant multiples are, or will be, invested by the private sector.

European PRI signatories manage over € 12 trillion[19] of funds and the amount professionally invested in private real estate is estimated as over € 1.5 trillion in 2012[20]. Europe's 2050 decarbonisation target will require cumulative energy efficiency investments of € 4.25 trillion euros[21] above the business as usual pathway from now until 2050 and the key will be to identify instruments and approaches which can connect this investment need with the appropriate finance sources. Increasing the level of confidence between different stakeholders, through the mechanisms identified and described in EEFIG's work, can help unlock the needed public and private finance sources and fill the energy efficiency investment gap.

B. Introduction to EEFIG and the Scope of this Report

The Energy Efficiency Financial Institution Group ("EEFIG") was established as a permanent working group for the European Commission, in late 2013, as a result of the dialogue on these matters between DG Energy and UNEP FI, as both institutions were engaging with financial institutions to determine how to overcome the well documented challenges inherent to obtaining long-term financing for energy efficiency[22]. EEFIG has some 51 individual members drawn from the organizations listed on page 3.

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[15] eg. UNEP (2013). *The Emissions Gap Report 2013: A UNEP Synthesis Report.* Retrieved from: http://www.unep.org/pdf/UNEPEmissionsGapReport2013.pdf

[16] COM (2012) Consultation Paper: "Financial Support for Energy Efficiency in Buildings"; and EURIMA. (2012). *Financing Mechanisms for Europe's Buildings Renovation*. Retrieved from: http://www.climatestrategy.es/index.php?id=27

[17] DIW. (2013). Financing of Energy Efficiency: Influences on European Public Banks' Actions and Ways Forward. Retrieved from: http://hayek.diw.de/documents/publikationen/73/diw_01.c.422405.de/hudson_financing.pdf

[18] COM (2012) Consultation Paper: "Financial Support for Energy Efficiency in Buildings" and 2013 Analysis by the Coalition for Energy Savings' of indicative national energy efficiency targets, which member states were to report to the Commission by April 2013, showed the EU is expected to miss its 20% target of 1483 million tonnes of oil equivalent (Mtoe) for 2020 by a 68Mtoe equal to 4.5%.

[19] KPMG. (2013). *European Responsible Investing Fund Survey 2013*. Retrieved from: http://www.kpmg.com/LU/en/IssuesAndInsights/Articlespublications/Documents/European-Responsible-Investing-Fund-Survey-2013.pdf

[20] IPD (2013). Multinational Index Spreadsheet 2013, update 6. 'All Property: estimated size of total market (EUR m)'. International Property Databank, not publicly available, enquiries@ipd.com

[21] E3G. (2013). The Macroeconomic Benefits of Energy Efficiency: The case for public action. Retrieved from: http://www.e3g.org/images/uploads/E3G_The_macroeconomic_case_for_energy_efficiency-Apr_2012.pdf

[22] ING. (2013). *Energy efficiency is widely regarded as "low-hanging-fruit" but many financial barriers exist that prevent money from flowing into the industry* [Slide]. Retrieved from: http://www.ing.nl/Images/EBZ_ING-Saving_Energy_in_the_Netherlands-May_2013_tcm7-134961.pdf?id=20130825072514

In order to ensure EEFIG's representativeness, practical knowledge base and deep engagement with the finance sector, over 40% of the individual members of EEFIG either work for, or directly represent, financial institutions and the remainder have worked for finance institutions or were hand selected for their prior experience and track record of engagement in matters pertaining to the financing of energy efficiency.

This report is an interim delivery of the EEFIG summarizing its initial work and thinking over the 6 months between October 2013 and March 2014. While EEFIG is keen to address energy efficiency investments as a whole, in this interim report the group has focused the scope of its immediate work to cover just the different segments of the buildings sector in the EU. For its final report later in 2014, EEFIG plans to deepen its work in the buildings sector and also consider energy efficiency investments in Small and Medium Sized Enterprises (SMEs) and Industry in Europe.

The group was tasked to consider the following questions to increase the flow of energy efficiency investments from a financial institution's perspective:

1. **What are the most imminent challenges that must be overcome?**

   Given the large amounts written on this subject, this question was designed to bring focus to EEFIG's discussions without ignoring the complexity of the topic. The group addressed this question by identifying and discussing the main drivers that would enable the development of a vibrant market for energy efficiency investments in buildings.

2. **Who would be the right party to address them?**

   Having identified multiple challenges to be overcome, and the drivers for developing such a market, these were prioritized and the relevant, or most suitable, actors identified to address them. While EEFIG would wish that there were a single party to address each challenge, its recommendations are characterized by the adoption of appropriate methods or approaches by many parties to "develop confidence and support the emergence of a market" and "establish synergies between stakeholders" often working from different directions at the same time.

3. **What should the European Commission/ EU do?**

   Having prioritized the drivers and assessed a set of approaches and instruments applicable to the different stakeholders, EEFIG is keen to provide a set of practical recommendations to policy makers to increase the flow of energy efficiency investments in Europe.

This interim report should be considered as a set of preliminary findings which are subject to modification and update through the group's work from April to October 2014 and the delivery of its final report.

The structure of this interim report reflects the structure and organization of the EEFIG process to date and is written in the name of EEFIG as a consensus based and collective opinion of the members of the group as a whole.

C. EU Buildings Market Investment Characterization

Buildings are responsible for the largest share of European final energy consumption (40%[23]) and they represent the greatest potential to save energy - as 75% of buildings standing in the EU were built during periods with no, or minimal, energy-related building codes[24]. Buildings are long-term assets expected to remain useful for 50-100 years[25] and three quarters of those standing today are expected to remain in use in 2050[26]. With low demolition rates (0.1% per year), low refurbishment rates (1.2% per year)[27] and moves to highly energy efficient new-build (1% additions per year), Europe's energy efficiency challenge in buildings mainly concerns the energy efficient refurbishment and investments in its existing buildings stock.

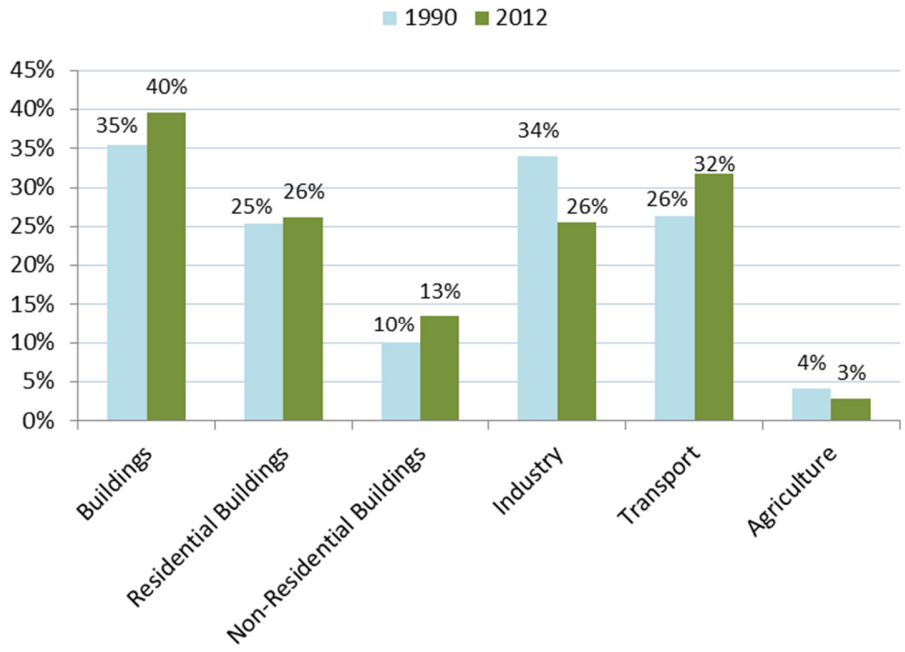

Figure 1: Share of buildings in final energy consumption in EU-28 (Source: Eurostat)

The energy efficient refurbishment of existing buildings is certainly a complex task to undertake[28]. This is due to the wide range of building types, their age, different uses and energy consumption patterns, but it is no more complex than other equivalent challenges facing EU Member States and it comes with the significant public and private benefits described above. In order to make EEFIG's approach and recommendations to increase investments in the energy efficient refurbishment of EU buildings more practical, the sector has been segmented into: Commercial Buildings, Publicly Owned Buildings and Private Residential Buildings. It became clear during EEFIG's deliberations that the

[23] Enerdata. (2012). *Energy Efficiency Trends in Buildings in the EU*. Retrieved from: http://www.odyssee-mure.eu/publications/br/Buildings-brochure-2012.pdf

[24] Ristori, D. (March 6, 2013). *JRC Conference on "Scientific Support to EU Growth and Jobs: Efficient buildings, vehicles and equipment* [Introductory Remarks]. Retrieved from: http://ec.europa.eu/dgs/jrc/index.cfm?id=2470&obj_id=4330&dt_code=EVN

[25] COM (2008) 780 final.

[26] COM (2012) Consultation Paper: "Financial Support for Energy Efficiency in Buildings".

[27] EuroACE. (2014). *Renovate Europe* [Website]. Source: Retrieved from: http://www.euroace.org/Resources/Projects/RenovateEurope.aspx

[28] World Business Council for Sustainable Development. (2009). *Energy Efficiency in Buildings: Transforming the Mar*ket. Retrieved from: http://www.wbcsd.org/transformingthemarketeeb.aspx

approaches and recommendations to increase energy efficiency investments in these three segments are materially different.

Finally, increased investments in energy efficient buildings refurbishment will not be attained just through "the market" in any segment at the levels required to meet Europe's political goals for the year 2050. Market forces will need to be complemented by public funds, a pragmatic and supportive regulatory environment and a fundamental behavior change among sector stakeholders.

This report identifies a clear need to increase demand for energy efficiency investments in each of Europe's buildings segments. It also identifies a need to increase the supply of providers to identify, deliver and verify high quality refurbishments and to provide a supply of finance for them. Much of the existing literature and research on energy efficiency finance deals (often implicitly) with the drivers of the supply of finance for energy efficiency investments, EEFIG believes that addressing the demand for energy efficiency investments in buildings refurbishment is critical and that often the approaches and instruments required to drive demand are different from, and yet connected to, those which will unlock energy efficiency investment supply.

2. Drivers of Demand for and Supply of Energy Efficiency Investments in EU Buildings

A. Definitions and Introduction

To interpret EEFIG's prioritization of the drivers of demand and supply for energy efficiency investments in the renovation of buildings in the EU, a clear definition of terms and characterization of the segments addressed is required. The following are the definitions of the building sector segments and various drivers as understood and agreed by consensus by EEFIG members and resulting from its survey work to order the group's thinking and around which to focus its recommendations in Sections 3 and 4 of this interim report. These definitions will be further refined for EEFIG's final report:

Market Segments

1. **Commercial Buildings**: Commercial buildings are used primarily for business purposes and include shopping centers, offices, restaurants, hotels, hospitals, garages and stores. In many cases, varying significantly by Member State, the businesses that occupy the commercial building lease their space and a third party investor owns the building and collects rent from its occupants. A key challenge for energy efficiency investments in commercial buildings is that investment decisions are often based on short-term time horizons[29] and there can be a split incentive between the owner and the occupier – as the occupant usually pays the energy bills. Notwithstanding this, commercial buildings are often larger, more energy intensive[30], are often owned in portfolios, managed like financial assets and have their own facilities managers who can be a useful technical resource, when adequately incentivized. Commercial buildings use 13%[31] of the energy consumed in EU buildings.
2. **Public Buildings**: Public buildings are those owned or operated by a governing body (central, regional or local) and often occupied by a government entity or agency. EEFIG also includes in this segment publicly owned residential buildings – such as social housing – and public schools and universities. Publicly owned or occupied buildings represent about 12% by area of the EU building stock[32]. Energy efficiency investments in public buildings are unique in that the public owner can perceive both the energy savings, productivity and value improvements normally accruing to the owner (as for private owners) as well as the public goods of increased employment, reduced emissions and improvements to public accounts. In principle, public buildings share many of the benefits of commercial buildings (size, energy intensity, concentrated ownership, professionalized facilities managers) but face additional challenges of more cumbersome procurement procedures, potential split incentives between different divisions responsible for procurement and for the energy bills, balance sheet restrictions and limitations under public accounting rules.
3. **Private Residential Buildings**: Private residential buildings can be sub-segmented into multi-family dwellings, semi-detached and single family homes and they are owned or rented. Residential buildings account for around two thirds of final energy consumption in European

[29] World Business Council for Sustainable Development. (2009). *Energy Efficiency in Buildings: Transforming the Market.* Retrieved from: http://www.wbcsd.org/transformingthemarketeeb.aspx

[30] BPIE. (2011). Europe's Buildings under the Microscope: A country-by-country review of the energy performance of buildings. Retrieved from: www.bpie.eu/eu_buildings_under_microscope.html

[31] Enerdata. (2012). *Energy Efficiency Trends in Buildings in the EU.* Retrieved from: http://www.odyssee-mure.eu/publications/br/Buildings-brochure-2012.pdf

[32] Ecorys, Ecofys and BioIntelligence (2010): Study to Support the Impact Assessment for the EU Energy Saving Action Plan.

buildings[33] and, depending upon Member State, can be owner occupied (resolving owner-tenant split incentives, but not necessarily between current and future owners), can be highly inefficient and often have economically attractive energy efficiency investment returns, yet this market segment is highly fragmented and requires a successful and low cost retail distribution strategy to engage at scale.

Energy Efficiency Investment Drivers

During EEFIG deliberations on the many drivers of energy efficiency investments, members identified a set of key drivers whose importance was indicated in physical meetings and through a survey of EEFIG members. These key drivers are listed in the following table in alphabetic order and separated – where relevant – to reflect a specific importance in one or another of the buildings segments:

Key Driver	Explanation
All Buildings Segments	
Availability and use of European Structural and Investment Funds 2014-2020[34]	€23 billion of European Structural and Investment Funds are available for the transition to the low carbon economy and hence are available for energy efficiency investments in the EU from 2014-2020. Given the scale of additional investment needed in buildings to 2020, it is vital that they are targeted in a smart way that maximizes the leverage of private sector investment. As such, a move away from grants toward the greater use of financial instruments which blend public and private funds will maximize the impact of these funds in accordance with national regulations.
Availability of Data[35]	That useful data on the key aspects pertaining to energy efficiency investments and their observed performance and track record be made available to prospective energy efficiency investors.
Buildings Regulation, Building Certification and Energy Performance Certificates[36]	Buildings energy codes within national buildings regulation must support energy efficiency investments in all types of buildings. As such they must be extended from new to existing buildings. Energy performance certificates are mandatory, as specified in EPBD 2010, and they need to be enforced, visible and, through standardization, contain relevant and reliable information (both design and operational) for use in the business case for energy efficiency investments. Easier comparison across countries would facilitate the delivery of a single market for energy efficiency – which in turn would lower transaction costs for businesses.
Effective Enforcement of Regulation	A strong regulatory framework (building codes, minimum energy performance, etc) and its practical enforcement with effective and material penalties to ensure compliance.

[33] Enerdata. (2012). *Energy Efficiency Trends in Buildings in the EU.* Retrieved from: http://www.odyssee-mure.eu/publications/br/Buildings-brochure-2012.pdf

[34] EEFIG notes that the operational programmes, in some countries, are already well developed and hence it understands the time constraints of its recommendations in this area.

[35] Some EEFIG members also saw "Availability of Data" as, by definition, included in "Standardization".

[36] Article 2(12) of Directive 2010/31/EU on the Energy Performance of Buildings establishes that '*energy performance certificate' means a certificate recognised by a Member State or by a legal person designated by it, which indicates the energy performance of a building or building unit, calculated according to a methodology adopted in accordance with Article 3*' of this Directive.

Increased Investor Confidence and Changes in Risk Perception	At present Investors perceive the risks of investing in energy efficiency to be higher than real estate stakeholders believe is appropriate. Increased investor's understanding of risks would improve confidence and lead to a greater alignment of the risks perceived and those realized by energy efficiency investments. The accountability of parties along the whole investment chain is needed to build this trust.
Leadership and Awareness at Key Decision Maker Level	Refers to political leadership but also leadership within the public and private sectors. Both in the public and private sector energy costs are often monitored and managed by professionals without access to the top leadership teams. As such the impact of rising energy costs may not be discussed at a level senior enough to consider multi-annual investments in energy efficiency to address these impacts. There is a need for public and private sector leaders to have a greater awareness of the potential for energy efficiency to offset rising energy prices. In addition, where a strong business case is identified and investments follow, these should be publicized to further catalyse awareness.
Lenders' approach to energy efficiency investment risk (Recourse vs Non-Recourse Loans)	That lenders of finance for energy efficiency building refurbishments consider the economic benefits (derived substantially through reduced energy bills and increased asset value – if realizable) of such investment and asset improvement, rather than only look at the general creditworthiness of the building owner in its assessment of risk.
Measurement, Reporting & Verification and Quality Assurance	Energy efficiency investments, buildings refurbishment and the resulting or attainable energy savings to be measured, reported on and verified in a standardized, clear, transparent and high quality manner and for these quality standards to be assured.
Regulatory Stability	Returns on energy efficiency investment may be delivered over long time-periods (up to 25 years)._ It is vital that investors have confidence that there is a robust, stable and consistent regulatory framework underpinning energy efficiency investments, their finance and that their returns as stable over the timeframe of those investments.
Risk-Return Targets	That the target level of returns required for energy efficiency investments in buildings should more accurately reflect the levels of risk implicit in the investment. Including: tangible energy savings, positive impact to investment performance and other benefits such as consistent mortgage repayments.
Simplicity and Transaction Costs	That investment procedures, data availability and standards reduce the perceived complexity of energy efficiency investments and in so doing make them simpler and straightforward to execute, finance and to reduce their transaction costs.
Standardization	The availability, adoption and common usage of an accepted set of standards for key aspects of the energy efficiency investment process. They are related to how energy savings are measured, reported and verified (to allow comparison between projects and between countries) and related to the legal structuring of contracts (to allow bundling of contracts to facilitating aggregation of investments). They include: • For Governments: Comparable and "open-source" methodologies for calculating the energy saving impacts of policies (including the future energy price assumptions used); Clear and replicable methodologies for developing national Energy Performance Certificates; • For business and financiers: Use of harmonised approaches to data collection; Use of harmonized approaches to developing metrics for baseline

	estimations of energy use as well as measurement, verification and reporting on energy savings achieved. Different methodologies may be needed for different sectors. Use of standardised legal structures used for Energy Performance Contracting and other forms of energy efficiency finance contracts. These standards should be "open source" and establish a common vocabulary and shared knowledge between stakeholders and financial institutions to overcome market failures.
Mainly Applying to Commercial Buildings	
Clear Business Case for Energy Efficiency	A well-articulated business case for an energy efficient building refurbishment backed by financial modeling that shows the investment delivers sufficient risk adjusted returns over the timeframe required by the public and/or private investor. The hurdle rate will differ depending on whether the investor in private (and uses a commercial discount rate) or public (and so may use a social discount rate). If relevant, increased building lifetime, other material non-energy benefits and the additional costs associated with alternative routes should be included.
Mainly Applying to Public Buildings	
Facilitation and Technical Assistance	Municipalities and regions are in a position to potentially develop large area-based refurbishment schemes and, as such, develop a pipeline of projects for financing. They are constrained by a lack of technical expertise to be able to identify and develop projects. They are also constrained by a lack of financial resources to pay for the costs of such expertise in order to develop financeable business plans. Feasibility studies may also be required, the upfront costs of which similarly need financing before projects can move to development.
Rules on Public Authority Procurement, Accounting and Reporting	Current rules on public procurement rules are onerous and create barriers to investment. Efforts are needed to streamline this process. In addition public sector accounting rules currently record the cost but not the benefit of investment. With the capacity of the public sector to take on debt constrained anyway, this limits the opportunities for many investment to go ahead.
Mainly Applying to Private Residential Buildings	
Behavioural Economics	The recognition that decision makers are not always economically rational. As such, decisions about undertaking energy efficiency investments will depend on other factors in addition to the economic case, such as how effective marketing material is; peer pressure what neighbours, friends and family do; perception of other value components accruing from efficiency refurbishments – such as comfort, health benefits, modernization of properties among others.
Fiscal Support	For investments in highly energy efficient building refurbishments to provide the investor a fiscal benefit (such as full or partial tax deductibility), to be adjusted based on the ambition of the retrofit and the resulting energy savings.
Individual Homeowner's Repayment Capacity	House incomes vary widely between and within countries. Given the upfront costs of energy efficiency refurbishment this can suppress demand. This is particularly the case for lower income countries as a whole and households. As such there needs to be a focus on addressing upfront costs for example through loans. For those who are able to pay for refurbishments, loans must be affordable as part of monthly

	outgoings. Future energy bill reductions due to energy efficiency investments should be factored into these calculations but in some cases may not cover the full cost of loan repayment. In this scenario consideration is needed by governments on whether additional measures are needed to address this shortfall and incentivize investment. Without this demand will be suppressed.
On-bill financing Mechanism	That repayments for energy efficiency investments are made within an existing, robust and well-functioning payment system such as that used by utilities to collect energy payments or that used by the public administration to collect taxes. Examples are the PACE system in the US and Green Deal in the UK.
Tailored Financial Product Availability	Energy efficiency investments have unique characteristics. They are not repaid via clearly identified receivables, there may be uncertainty over the predictability of revenue streams, and using on bill financing they may not be linked to a single identified individual or legal entity. Therefore particular financial products must be created and promoted specifically for the purpose of energy efficiency investments that address these issues and stimulate and match demand.

B. Analysis and Prioritization of the Drivers of Demand for Energy Efficiency Investments in Buildings

The lack of demand for energy efficiency investments remains perhaps the most critical missing element preventing the greater allocation of resources from financial institutions towards this sector. The EEFIG group discussed and identified 25 drivers affecting demand for energy efficiency investment for buildings refurbishment through open debate among its members in its January 2014 meeting. Subsequently, 51 EEFIG members answered an online survey requiring the weighting in importance of these 25 drivers for each different segment of the buildings market – a full explanation of the EEFIG Relevant Driver Survey can be found in the Appendix. The following table 2 provides a summary of the results of this exercise (each driver is ranked 1-25 in terms of its survey score for each building segment; top ranks are coloured with greater intensity blue) and the group's observations and analysis are discussed below:

***Table 2**: EEFIG ranking of key drivers affecting demand for energy efficiency investment by market segment.*

Buildings Sector	Commer-cial	Public	Public Rental	Owner Occupied	Private Rental	Average Rank
Standardization	6	3	1	11	2	4.6
Clear Business Case	1	7	9	9	4	6
Effective enforcement of regulation	4	6	6	8	6	6
Awareness at Key Decision Maker Level & Leadership	2	2	2	12	13	6.2
Buildings Regulation, Certification and Energy Performance Certificates	5	4	3	13	11	7.2
Tailored Financial Product availability	18	11	7	5	3	8.8
Transaction costs / simplicity	10	16	12	2	5	9
Regulation which impacts on timing and scope of renovation	7	8	4	15	14	9.6
Regulatory Stability	3	9	10	19	9	10
Facilitation/ Technical Assistance	22	5	8	10	15	12
Fiscal Support	14	25	22	4	1	13.2
Body of Evidence (including Social Benefits and Costs)	13	13	11	16	17	14
(Individual/ Owner) Payment Capacity	23	22	18	1	8	14.4
Awareness of appropriate timing for energy efficiency measures within the traditional building cycle	16	15	13	18	10	14.4
Awareness. Communication & Marketing	20	20	24	6	7	15.4
Measurement, Reporting & Verification (MRV) and Quality Assurance	9	10	15	22	21	15.4
"Green Premium" / Brown Discount	8	23	23	14	12	16
Rules on public authority accounting, procurement and reporting	25	1	5	25	25	16.2
Price of energy	11	19	21	7	24	16.4
Mandatory Energy Audits	15	14	17	21	19	17.2
Availability of Data	12	17	19	20	20	17.6
Definition and common understanding of the value of energy cost savings	17	18	16	17	23	18.2
Human Capacity	19	12	14	24	22	18.2
Behavioral Economics (personal priorities)	24	24	25	3	16	18.4
Communication between market actors	21	21	20	23	18	20.6

Most clearly, EEFIG members determined that the key drivers for demand for energy efficiency investments vary by buildings segment and are dramatically different in the owner occupied residential sector compared to others. EEFIG interprets this as a clear sign that, from a financial institution's perspective, buildings market segmentation for investments and policy making makes sense; and that there is no "one-size fits all" approach which can be equally successful in driving

energy efficiency demand across all segments of buildings in the EU. **However, a strong regulatory framework with effective enforcement of regulation is the only demand driver which EEFIG sees as a truly "cross-cutting" priority across all buildings segments.**

There is a high degree of agreement among EEFIG members that the demand for energy efficiency investments in the Commercial and Public Buildings segments is driven by strong leadership and awareness of the opportunities at the key decision maker level; Buildings regulation, building certification and energy performance certificates and Standardization. Commercial buildings' key decision makers also require a clear business case as well as assured regulatory stability; whereas EEFIG members see the rules guiding public authority accounting, procurement and reporting and facilitation and technical assistance as having the greatest impact on energy efficiency investment demand for Public buildings and clearly is of no impact on other segments.

For private residential buildings, EEFIG members collectively saw energy efficiency investment demand drivers being more related to individual payment capacities, which in turn is linked to behavioural economics and includes personal priorities; ease of undertaking investments (simplicity and the impact of financial and non-financial transaction costs); the need for tailored financial products; and the need for fiscal support in certain circumstances. This suggests that success in unlocking energy efficiency investment demand from homeowners will require having a simple, tailored, low interest rate (and potentially tax efficient) retail energy efficiency financing offer tailored to different income levels and which is cleverly positioned considering its full range of economic and non-economic benefits in the context of the householders priorities. While not ranked "top-5" it is also clear that EEFIG feels that awareness, communication and marketing is a priority to support the demand for energy efficiency investments in private residential buildings.

Contrary to initial expectations of come EEFIG members, the value enhancement ("Green Premium"/ Brown Discount) seems only to impact the demand for energy efficiency investments in commercial buildings. Similarly, "availability of data" may seem to rank surprisingly low, however in follow up discussion the group identified that both these terms where understood to be core components of a clear business case; and an ingredient to produce a tailored retail lending product for residential refurbishments. Finally, the energy price was not ranked very highly except in the residential sector.

C. Analysis and Prioritization of the Drivers of Supply of Energy Efficiency Investments in Buildings

The EEFIG group discussed and identified 23 drivers affecting the supply of finance for energy efficiency investments in buildings refurbishment through open debate among its members in its January 2014 meeting. In an online survey 51 EEFIG members weighted the importance of these 23 drivers for each different segment of the buildings market[37]. The following table 3 provides a summary of the results of this exercise (each driver is ranked 1-23 in terms of its survey score for each building segment; top ranks are coloured with greater intensity blue) and the group's observations and analysis are discussed overleaf:

[37] a full explanation of the EEFIG Relevant Driver Survey can be found in the Appendix

Table 3: EEFIG ranking of key drivers affecting supply of energy efficiency investment by market segment.

Buildings Sector	Commerc-ial	Public	Public Rental	Owner Occupied	Private Rental	Average Rank
Standardization	3	1	1	1	2	1.6
Regulatory Stability	1	4	2	4	3	2.8
Increased Investor Confidence & Change in Risk Perception	2	5	7	5	4	4.6
Transaction costs / simplicity	7	10	6	2	1	5.2
Measurement, Reporting & Verification (MRV) and Quality Assurance	4	2	4	10	8	5.6
Lender's approach to risk assessment (non-recourse project financing vs. Borrower-based credit recourse)	8	6	5	6	5	6
Risk-return targets	6	11	9	7	7	8
Use of European Structural & Investment Funds	18	3	3	11	9	8.8
Availability of Data	5	9	13	12	10	9.8
Price of energy	14	7	10	8	15	10.8
Aggregation Challenge	19	16	8	9	11	12.6
Buildings Regulation, Certification and Energy Performance Certificates	10	12	14	14	13	12.6
Definition and common understanding of the value of energy cost savings	12	8	15	17	18	14
Financial regulation	13	13	12	16	16	14
On-bill mechanism	22	22	18	3	6	14.2
Finance Supply from EEO in Article 7 of EED	23	18	11	15	12	15.8
Body of Evidence (including Social Benefits and Costs)	11	15	19	13	23	16.2
Capital Markets Environment	15	19	16	21	17	17.6
Sustainable Real Estate Funds	9	20	17	23	21	18
Fiscal Support	20	21	20	18	14	18.6
Communication between market actors	17	14	21	22	20	18.8
"Green Premium" / Brown Discount	16	23	22	19	19	19.8
Awareness. Communication & Marketing	21	17	23	20	22	20.6

Perhaps unsurprisingly for a financial institutions group, EEFIG members were in far stronger overall agreement around the priority drivers for the supply of energy efficiency investments than about the demand for them and in this case, while the residential sector still shows some divergence, many of the top ranked supply drivers are common across all buildings segments.

EEFIG members see the top drivers of the supply of energy efficiency investments as Standardization and Regulatory stability –having a strong and stable regulatory environment. In addition to these "cross-cutting" drivers, and looking at specific answers by market segment; Reduced transaction costs and Simplicity with on-bill repayment mechanisms appear as strong drivers of energy efficiency investment supply for the residential buildings sector; yet Measurement, reporting & verification combined with Quality assurance feature as key drivers of energy efficiency investment supply for commercial and public buildings; and Increased Investor Confidence and Changes in risk perception are ranked highly just in the commercial buildings sector.

Interestingly, table 4 shows just the EEFIG online survey responses on the supply drivers just from EEFIG group members working directly for or directly representing financial institutions (those closest to the institutions expected to provide finance). This subset of EEFIG members see the third

priority driving finance supply as the "Use of European Structural and Investment Funds" (ESIF) and there are other variations. While there are clear differences in the use of specific vocabulary between the different members of EEFIG, the high priority for use of ESIF to support energy efficiency investments in buildings is an indication of the need for public support to lever private sector capital and share certain risks. The group as a whole captures this idea in the "need for increased investor confidence" and "changes in the risk perceptions" for energy efficiency investments and sees ESIF being more directed to support the renovation of Public Buildings rather than across all buildings segments.

Finally, the recourse vs non-recourse nature of lenders' risk assessment of energy efficiency investments ranks as a high priority for all members – but just the financial institutions note the importance and impact of financial regulation on investment supply. EEFIG members directly representing financial institutions noted that capital adequacy requirements within financial regulations (Basel 3 for banks and Solvency 2 for insurance companies) would need careful attention for their impacts on the capacity and ability of financial institutions to deploy long-term funds, in general, and specifically into real estate.

Table 4: Sub-set of survey responses ranking key drivers affecting supply of energy efficiency investments only from EEFIG members representing Financial Institutions directly.

Buildings Sector	Commer-cial	Public	Public Rental	Owner Occupied	Private Rental	Average Rank
Regulatory Stability	1	2	1	1	1	1.2
Standardization	3	1	2	3	2	2.2
Use of European Structural & Investment Funds	2	3	3	2	3	2.6
Measurement, Reporting & Verification (MRV) and Quality Assurance	5	4	4	6	6	5
Transaction costs / simplicity	7	14	6	4	4	7
Financial regulation	6	9	7	9	9	8
Lender's approach to risk assessment (non-recourse project financing vs. Borrower-based credit recourse)	8	5	5	11	11	8
Risk-return targets	10	13	12	5	7	9.4
Increased Investor Confidence & Change in Risk Perception	4	6	16	13	10	9.8
Buildings Regulation, Certification and Energy Performance Certificates	12	11	10	8	13	10.8
Sustainable Real Estate Funds	11	8	9	20	14	12.4
Availability of Data	9	16	18	12	8	12.6
Definition and common understanding of the value of energy cost savings	13	7	13	17	17	13.4
On-bill mechanism	22	22	17	7	5	14.6
Finance Supply from EEO in Article 7 of EED	21	19	8	10	16	14.8
Price of energy	20	12	11	16	20	15.8
Aggregation Challenge	16	15	15	18	18	16.4
Communication between market actors	14	10	14	22	22	16.4
Fiscal Support	19	21	22	15	12	17.8
"Green Premium" / Brown Discount	17	23	23	14	15	18.4
Capital Markets Environment	15	20	19	19	19	18.4
Body of Evidence (including Social Benefits and Costs)	18	18	20	21	23	20
Awareness. Communication & Marketing	23	17	21	23	21	21

D. EEFIG Conclusions and Insights into the Drivers of Energy Efficiency Investments (Demand & Supply)

EEFIG's overall discussions and complemented by its prioritization exercise for the drivers of demand for and supply of energy efficiency investments for buildings refurbishment generated a key set of conclusions and insights which are summarised here:

- **There is no "silver bullet"**: Stimulating greater volumes of energy efficiency investments in buildings cannot be resolved with a single policy or instrument or stakeholder group. Different approaches, instruments and solutions will be required for different segments of the buildings sector and while all of the 23-25 drivers identified by EEFIG members have some role to play in the solution, clearly some will have a more significant impact on investment flows than others. However, managing this level of complexity is not unusual within financial institutions and real estate businesses. EEFIG members believe that a tailored approach can be built over time to handle the level of complexity, detailed information and aggregation required to address each of these drivers.
- **There is a clear "base-line" of cross-cutting drivers**: There are a clearly identifiable set of drivers which must be in-place to create the necessary conditions for energy efficiency investments to flow in greater volume into buildings refurbishments across all segments. These include: Standardization of key aspects of the energy efficiency investment process, that should be "open source" establishing a common vocabulary, shared knowledge and performance data between stakeholders and financial institutions; A strong, stable and effectively enforced regulatory framework, including Building Regulations, Building Certification and Energy performance certificates; and the smart use of EU Structural & Investment funds to leverage private funds and provide technical assistance.
- **Specific Measures are required for Specific Segments**: In addition to the "base-line" of cross-cutting drivers there are a further set of segment-specific energy efficiency investment drivers that can be summarised by segment:
    - **Commercial Buildings**: The keys to unlock energy efficiency investment flows in the commercial buildings sector are to engage key decision makers and sector leaders with a clear business case to increase their confidence and understanding of the risks, supported by strong measurement, verification and reporting protocols and quality assurance.
    - **Public Buildings**: There needs to be greater awareness of the energy efficiency opportunities and benefits at key decision maker level within the public owners and leadership demonstrated by the ambitious and timely energy efficiency refurbishment of the buildings they control. This should be facilitated through technical assistance to relevant public sector bodies and a careful review of the public authority procurement and accounting process[38]. That the later ensure that the energy savings and other multiple benefits accruing to refurbished buildings are properly reflected and that balance sheet debt restrictions do not *ex-ante* prohibit public authorities from refurbishing buildings which will deliver net economic benefits to the owner and Member State.
    - **Private Residential Buildings**: A simple, easily accessible, low interest rate, tax beneficial (ideally) retail energy efficiency financing offer is required that should be

[38] The European System of Account (ESA) and Eurostat's methodology should support energy efficiency renovations in public buildings (Energy Performance Contracts); Ref : Eurostat. (2013). *Manual for statistics on energy consumption in households.* Retrieved from: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-GQ-13-003/EN/KS-GQ-13-003-EN.PDF

marketed widely through various trusted retail channels. The engagement of financial institutions and trusted local energy assessors in the supply of the financing for such residential energy efficiency refurbishment loans is facilitated by strong measurement, reporting & verification and quality assurance, on-bill finance mechanisms and supported by the use of European Structural & Investment Funds.

- **Financial Institutions see Energy Efficiency Investment Supply for Buildings as a Key Use of European Structural and Investment Funds 2014-2020**: Clearly, EEFIG members directly employed by or directly representing financial institutions believe the supply of energy efficiency investments for buildings refurbishment should be directly linked and supported as a priority by European Structural and Investment Funds, Horizon 2020 and ETS revenues (where applicable) across all buildings segments as well providing project development technical assistance funding.

3. Approaches and Instruments to Stimulate Energy Efficiency Investments in Buildings

Having identified, assessed and prioritized the necessary drivers of energy efficiency investments, EEFIG members held a structured debate on the approaches and instruments through which these drivers can be addressed.

A. Policy-led Approaches to Drive Investment

In order not to over simplify its discussions of "practical solutions", EEFIG members were keen to underline that in practice there are a series of approaches available to financial institutions and policy-makers which can loosely be sub-divided into Policy-led Approaches (those depending upon policy leadership) and Market-led Approaches (those requiring leadership from market participants). EEFIG believes that both approaches should be developed simultaneously.

Subsequent to the discussion on the approaches, EEFIG members made over thirty written submissions containing examples and analysis of existing and emerging financial instruments, whose increased use and wider development could further stimulate the market for energy efficiency investments in buildings.

This chapter summarizes this debate and in its conclusions links the key drivers of demand for and supply of energy efficiency investment (described in chapter 2) with the relevant approaches and instruments described here.

EEFIG identifies the following Policy-led approaches:

- **Optimize Use of EU Structural and Investment Funds for Energy Efficiency Investments in Buildings**: Ensure that there is a strong and coherent link between the National Building Renovation Strategies & Plans (Article 4 of Energy Efficiency Directive), National Energy Efficiency Funds (Article 20, EED) and the prioritization and allocation to support energy efficiency investments in buildings from financing available under the 2014-2020 European Structural and Investment Funds, Horizon 2020 and ETS revenues (where relevant). EEFIG supports ex-ante conditionality with respect of EPBD and EED and notes that public funds should stimulate above "business as usual" interventions in buildings and that they should promote a move beyond "minimum energy performance requirement levels" (which should in principle be delivered by the market alone) subject to specific technical assistance and

capacity building for the finance supply chain handling such facilities. In general, the deeper the renovation is, the higher the public support intensity.

- **Standardization and Improvement of Buildings Certification and Energy Performance Certificates**: Coherence, reliability, usefulness, ease of access and accuracy were all terms used by EEFIG members on their "wish list" for improvements and standardization of Energy Performance Certificates and Buildings certificates in EU Member States.

- **Open Source EU Buildings Energy Database**: EEFIG members proposed assessments of buildings energy usage and performance data availability and standardized processes for its collection, organization and open access for data on the existing building stock, in line with Eurostat and Inspire Directive standards. Several EEFIG members also felt that the EU should prioritize the resolution of any issues around data ownership and privacy which might prevent easy and appropriate access and usage of anonymized energy data collected by energy companies on buildings energy use. EEFIG felt that and EU buildings energy usage database reflecting some of the learnings from the Californian Public Utility Commission project[39] and the US Department of Energy Buildings Performance Database would be helpful; and some members felt that any platform could also access social media and crowd-sourced content generation approaches to support this aim. EEFIG felt that it was key to involve financial institutions, on a voluntary basis, in the design of the data requirements and functional usability of such a database also considering the potential administrative costs.

- **Industry and Finance supported National Buildings Renovation Roadmaps**: Long-term planning and engagement on buildings energy trajectories (considering a portfolio and life-cycle approach) should be developed in the context of National Buildings Renovation Strategies with and supported by the building industry and financial institutions.

B. Market-led Approaches to Drive Investment

EEFIG identified the following market-led approaches

- **Common Underwriting and Investment Procedures**: Launch of an EU-wide initiative to develop a common set of procedures and standards for energy efficiency and buildings refurbishment underwriting for both debt and equity investments (references were made to the US Investor Confidence Project[40] as a relevant model initiative);

- **More Proactive Engagement and Continuous Improvement and Usage of Energy Performance Certificates (EPCs) from Financial Institutions**: There is increasing evidence that EPCs are positively impacting the value for investors in residential and commercial property portfolios[41]. The building and finance industry should engage in the

[39] California Public Utilities Commission. (2012). *Energy Data Center: Briefing Paper*. Retrieved from: http://www.cpuc.ca.gov/NR/rdonlyres/8B005D2C-9698-4F16-BB2B-D07E707DA676/0/EnergyDataCenterFinal.pdf

[40] Investor Confidence Project. (2014). *Enabling Markets for Energy Efficiency Investment* [Website]. Retrieved from: http://www.eeperformance.org/

[41] European Commission. (2013). *Energy Performance Certificates in buildings and their impact on transaction prices and rents in selected EU countries*. Retrieved from: http://ec.europa.eu/energy/efficiency/buildings/doc/20130619-energy_performance_certificates_in_buildings.pdf

other examples (see following page footer):

TiasNimbas. (2014). *Energy label increases home sales in the Netherlands* [Web log comment]. Retrieved from: http://knowledge.tiasnimbas.edu/artikel/energy-label-increases-home-sales-netherlands

Rijksoverheid. (2014). *Puntensystem en energielabel* [Website]. Retrived from: http://www.rijksoverheid.nl/onderwerpen/huurwoning/puntensysteem-huurwoning/puntensysteem-en-energielabel

process of improving and strengthening the quality of Energy Performance Certificates across the EU, using successful examples like KfW-Energieeffizienzhaus for German residential homes. This can be achieved through the input of higher quality and more detailed data, internal verification of EPCs, making EPCs publicly available and providing feedback to policy makers on EPC upgrades from investors[42].

- **"Operational" Energy Performance Database**: "Better quality data" for energy efficiency investments has been an underlying, yet slightly generic, request from many financial institutions and industry stakeholders. An "operational" buildings energy performance database in each of the EU-28 Member States which conforms to shared data standards and collection protocols[43] and can be accessed and supported by bespoke portfolio benchmarking analysis such as those being piloted in the UK[44] by JLL and in France and Germany by the Green Rating Alliance[45]. This database can build upon the data increasingly available from smart-meter roll-out in the EU and the EPISCOPE-TABULA project[46]. To start, financial institutions and investors should clarify what data and data architecture they require and then working directly with policy-makers to determine how this is achieved - the US DOE's Buildings Performance Database was cited as example[47].

- **Project Ratings:** A rating system could be designed to provide a transparent assessment of the technical and financial risks of buildings renovation projects and their contracting structure. Project ratings would simplify the financing process and reduce transaction costs and an independent central agency, with adequate resources can be responsible for the initial rating and its maintenance over time.

- **Linking impact of building energy performance with investment performance:** Industry led initiatives can study the link between buildings energy performance and the impact on building investment performance. Risk analysis tools such as the IPD and RICS 'IPD Eco-PAS' tool, developed in the UK, enable risk management of buildings energy performance and can help clarify the level of risks associated with energy efficiency investment and raise investor confidence for this type of investment.

- **Life cycle portfolio-wide sustainability programmes**: Long-term planning and integration of energy efficiency in portfolio management throughout buildings investment life cycle developed and supported by the energy efficiency industry and financial institutions.

C. EEFIG Assessment of Selected Financial Instruments

[42] Example: Deutsche Asset and Wealth Management Real Estate. (2012). *Building Labels vs. Environmental Performance Metrics: Measuring What's Important about Building Sustainability*. Retrieved from: http://www.rreef.com/content/_media/Research_Sustainability_Metrics_in_the_Real_Estate_Sector-Oct_2012.pdf

[43] Such as those outlined in the following documents:

Eurostat. (2013). *Manual for statistics on energy consumption in households.* Retrieved from: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-GQ-13-003/EN/KS-GQ-13-003-EN.PDF

INSPIRE. (2010). *D2.8.III.2 Data Specification on Buildings – Technical Guidelines. Retrieved* from: http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_BU_v3.0.pdf

[44] JLL. (2014). *Real Estate Environmental Benchmark: An initiative by JLL and Better Buildings Partnership.* Retrieved from: http://www.joneslanglasalle.co.uk/UnitedKingdom/EN-GB/Pages/Real-Estate-Environmental-Benchmark.aspx

[45] Green Rating. (2014). [Website]. Retrieved from: http://www.green-rating.com/

[46] EPISCOPE. (2014). *IEE Project EPISCOPE* [Website]. Retrieved from: www.episcope.eu

[47] Office of Energy Efficiency & Renewable Energy. (2014). *Buildings Performance Database* [Website]. Retrieved from: http://energy.gov/eere/buildings/buildings-performance-database

Certain financial instruments and case studies were raised frequently during EEFIG discussions. This section identifies some selected existing and emerging financial instruments, with best practice examples, and reviews their sectoral applicability as well as certain key benefits and challenges which they face. EEFIG sees these financial instruments as being among those likely to fill the energy efficiency investment gap and offers this list as guidance as to the group's thinking and to focus its subsequent conclusions.

Existing Financial Instruments

1. Dedicated Credit Lines

Dedicated credit lines (or soft loans) are a mechanism where public funding decreases the cost of energy efficiency buildings refurbishment loans. The impact and relative success of dedicated credit lines can also be attributed to their retail distribution through networks of private banks.

Dedicated credit lines (Supply Driver)					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+	+		+	++
Led by:	Public sector funding usually with private money levered and often deployed alongside a grant programme.				
Advantages	- Easy to roll out, however careful ex-ante analysis of supply and demand and legal/tax framework needed - Standardised supply offering at the same time flexibility according to individual preferences (repayment, interest rate fixation etc.) - The use of Cohesion funds for soft loans in housing is facilitated with the "renovation loan" (off-the shelf instrument) - Allows 1:1 refinance to commercial banks (Basel III compliant) - Positive impact on public budgets due to leverage effects[48]				
Weaknesses	- Capacity/ willingness of owners to take more debt (ie very country dependent) - Risk aversion of banks (calling for guarantees from Governments) - Leverage effect of public funds is usually less than 10x and grants are often required alongside to improve energy efficiency ambition				
Main obstacles / legal changes required	- Transaction costs to implement (technically) and manage long-term programs within financing institute - Increased focus on optimal rather than minimum energy efficiency standards				
Best practice examples	Numerous: KfW, NRW.BANK, Kredex, EBRD Sustainable Finance Facilities (SEFF) etc.				

[48] KFW. (2011). *Impact on Public Budgets of KFW Promotional Programmes in the Field of "Energy-Efficient Building and Rehabilitation".* Retrieved from: https://www.kfw.de/migration/Weiterleitung-zur-Startseite/Homepage/KfW-Group/Research/PDF-Files/Energy-efficient-building-and-rehabilitation.pdf

2. Risk Sharing Facilities (Guarantee Funds and First-loss Facilities)

Risk-sharing facilities (Guarantee funds and First-loss Facilities) reduce the risks for banks by covering part of the risk of payment default by lenders – either through a guarantee or first-loss absorption. They can be combined with dedicated credit lines and are a key instrument to grow the amount of bank lending to energy efficiency refurbishment.

Risk-sharing facilities (Guarantee funds and First-loss Facilities – Supply Drivers)					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+		+	+	++
Led by:	Public sector funding with the aim of supporting wider private investments				
Advantages	- Reduces the risks for banks and enables them to lend greater amounts - Anecdotal evidence suggests that energy efficiency loans experience "market standard" or better credit performance therefore risk sharing facilities can be a transition phase until energy efficiency loans are mainstreamed - Provides extra leverage for private sector funds				
Weaknesses	- Time to structure and negotiate - Moral hazard if substantially all risk is removed from bank lending - Know-how to implement at regional and local government levels				
Main obstacles / legal changes required	- Often extensive and complex handling of risk-sharing facilities at EU level ("red tape") especially for smaller financial intermediaries and first-time users				
Best practice examples	- IFC's CEEF programme (Hungary, Czech Republic, Estonia, Latvia, Lithuania and Slovakia) - France's proposal to use the obligation from article 7 of EED to create a national guarantee fund for renovation loans - EERSF in Bulgaria - European Energy Efficiency Fund (EEEF)				

3. Direct and Equity Investments in Real Estate and Infrastructure Funds

Real Estate and Infrastructure funds already provide a large amount of 'invisible' energy efficiency investment in the building sector. This investment takes place during a fund's investment life cycle, new developments, refurbishments, planned and preventive maintenance and active building management. Real Estate investment funds are a key channel to scale up finance in energy efficiency in buildings, both through increased equity investments in the funds and through increased fund activity in energy efficiency, where it can be facilitated by strong regulatory and market frameworks.

According to the 2013 Global Real Estate Sustainability Benchmark survey (GRESB)[49], 70% of its participants, managing US$ 1.6 trillion gross assets, have an Environmental Management System in place, which on average covers 77% of their portfolios. In this context, EEFIG members noted the emergence of a new sub-class of Sustainable Real Estate Funds whose strict application of socially

[49] GRESB. (2013). *2013 GRESB REPORT*. Retrieved from: http://gresb.com/content/GRESB_Report_2013_Singlepage_HR.pdf

responsible investment criteria and potential focus on best-in class energy performance buildings could positively impact the supply of funding for energy efficiency investments in buildings.

Dedicated Real Estate and Infrastructure Funds					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+	+		+	
Led by:	Private sector and Institutional Investor funding and Real Estate Equity Funds investing in companies in the commercial and residential property sector.				
Advantages	- Existing instruments well established existing instruments across the EU - High leverage effect - Limits need for public funding - Rewarding companies' efforts to reduce their assets' obsolescence risks by investing in best performers - Sustainability and environmental criteria can be embedded as part of company's due diligence and valuation process - Fund managers can influence companies' environmental policies in relation to energy efficiency - Aggregating energy efficiency gains from buildings to portfolio level.				
Weaknesses	- Difficult to estimate proportion of funds invested in energy efficiency - Limited to cost effective investment within the investment timeframe of each fund - Should deliver adequate return investment performance returns to investors, aligned with the investment risk, and (if possible) measurable and comparable to financial instruments that provide a similar level of returns - In the absence of specific regulatory requirements, achievements will occur but could be limited to best practice within the industry, or to focus on the low-hanging fruit, e.g. just "quick wins".				
Main obstacles / legal changes required	None				
Best practice examples	- Numerous: Listed and unlisted real estate investment fund - Real Estate companies - Infrastructure funds				

4. Energy Performance Contracting (Demand Driver)

An Energy Performance Contract (EPC) is a contractual arrangement between the beneficiary and the provider of an energy efficiency improvement measure, verified and monitored during the whole term of the contract, where investments (work, supply or service) in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed energy performance criterion, such as financial savings. Such contracts usually involve an Energy Service Company (ESCO) which is responsible for investment and the delivery of guaranteed savings to client.

Energy Performance Contracting (Demand Driver)					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+	++			? (Multi-family)
Led by:	Private sector				
Advantages	- Turnkey contract - EPC provider manages the performance risks - Professionalism and expertise of EPC providers - ESCO can bring some financing				
Weaknesses	- Traditionally focussed on low hanging fruits (high returns) - Increases transaction costs - Requires more developed skills on the client side - Lack of standardised framework and templates - Difficulties to enforce legal rights for ESCO service providers				
Main obstacles / legal changes required	- Public Accounting Treatment (On/off-balance sheet) - Lack of confidence in ESCOs - Lack of understanding of the EPC concept - Split incentives in the rental sector - Procurement regulations may not be adapted at national level - Traditional ESCO actors focused on shallow retrofit and not interested in deep retrofit, while deep retrofit companies do not call themselves ESCOs - EPC is seen as a self-financing whereas for deep renovation it is only part of the financing – the rest can come from grants or additional investment from the owner based on "green premium" - Deep renovation often happens with general refurbishment measures which increase the overall investment - Fear of externalisation of energy management				
Best practice examples	Numerous: Barts Health Care Trust[50], Peterborough Council[51] London's RE:FIT programme created by the Greater London Authority (UK)[52]; Rhone-Alps OSER for deep retrofits of public buildings[53] and Croatian ESCO HEP[54].				

Emerging Financial Instruments

There are high expectations of certain "innovative" or emerging financial instruments which have a shorter track record and can unlock new and more tailored finance sources for energy efficiency investments:

[50] Barts Healthcare Trust. (2014). [Website]. Retrieved from: http://www.bartshealth.nhs.uk/

[51] Peterborough City Council. *Housing*. Retrieved from: http://www.peterborough.gov.uk/housing.aspx

[52] Greater London Authority. (2014). *RE:FIT – Putting our energy into reducing yours.* Retrieved from: http://www.london.gov.uk/priorities/environment/tackling-climate-change/energy-efficiency/refit-putting-our-energy-reducing-yours

[53] OSER. (2014). *SPL-OSER, l'efficacité énergétique en Rhône-Alpes*. Retrieved from: http://spl-oser.fr/

[54] HEP ESCO. (2014). [Website]. Retrieved from: http://www.hep.hr/esco/en/aboutus/default.aspx

1. On-Bill Repayment (Supply Driver)

On-Bill Repayment is a mechanism used to improve the creditworthiness (or seniority) of energy efficiency investments by having them repaid in the utility or tax bill and through the existing payment collection infrastructures of utilities or public authorities. This levers the existing payment relationship between customer and utility/ tax authority and directly provides a "credit history" giving an accurate view of likely defaults (as customer payment histories with both utilities and tax payments are long and exhibit low default rates compared to other consumer finance).

On-Bill Repayment (Supply Driver)					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	+	+	+	+	+
Led by:	Policy implementation together with obligations on Utilities and/or banks				
Advantages	- Energy savings connected to energy bills - Public sector actors and utilities are more trusted by homeowners - Reduces transaction costs - Can overcome the split incentive – ie is connected to property not occupant - Overcomes the lack of finance capacity of homeowners				
Weaknesses	- May initially require additional public support (in form of risk sharing facility) to provide finance at an acceptable consumer cost - Can be perceived as complex by users and may require technical assistance in order to avoid focus on low-hanging fruits - Complex scheme to manage/ market				
Main obstacles / legal changes required	- May require changes in the legal framework, in order to comply with banking monopoly - May require modification to utility/ tax collection processing systems and/or tax code/ energy laws				
Best practice examples	Numerous examples in the US (NY, PA, CT, VT) Green Deal in the UK and Picardie region, France.				

2. Green Bonds for Green Buildings (Supply Driver)

In general, a Green Bond is one for which the issuer declares that the proceeds will be applied (either by ring-fencing, direct project exposure or securitization) towards climate and/or environmental sustainability purposes[55]. Green bonds were developed by the World Bank in conjunction with SEB in 2007-08 and issuers issued over $10 billion of them during 2013. Given the long-term, stable characteristics of real-estate assets, debt financing is usual for buildings and hence the new market for green bonds is a natural place for investors to seek capital for energy efficiency investments in green buildings.

[55] More detail on the definition of Green Bonds see:
Climate Bonds Initiative. (2013). *FYI: Full text of Green Bonds Framework-steering c'tte now set up w. BoAML, Citi, JPM, MS + others in process of joining* [Web log comment]. Retrieved from: http://www.climatebonds.net/2013/11/full-text-of-green-bonds-framework/#sthash.lKbSNecd.dpuf

Green Bonds for Green Buildings (Supply Driver)					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing
	++	+	+	+	Refinancing only
Led by:	Private sector and Institutional Investors				
Advantages	- Large and deep pools of investor finance - Applies to most building segments - High leverage effect - Limited need for public funding - Strong market signalling - Simplifies to attract new investors				
Weaknesses	- Needs large size to provide liquidity to bondholders (eg. $300+ million) Limited to cost effective investment within the investment timeframe of each fund - Should deliver adequate return investment performance returns to investors, aligned with the investment risk , and (if possible) measurable and comparable to financial instruments that provide a similar level of returns.				
Main obstacles / legal changes required	None				
Best practice examples	- Unibail Rodamco green building bond - Climate Bond Initiative - Various Development Bank issuers (World Bank, IFC etc) for general green bonds.				

3. Energy Services Agreement (Demand Driver)

The Energy Service Agreement (ESA) is a "pay-for-performance" service contract between a third-party investor and a building owner to deliver energy savings as a service to the building. The ESA is in some ways an evolution of the traditional shared-savings model, provide through Energy Performance Contract (EPC), but it is structured more like a Power Purchase Agreement (PPA) used more frequently in the mainstream energy markets. A 3rd party investor and a building owner enter into an ESA contract (usually for 10 years) where the building owner agrees to pay their historical utility bills to the 3rd party. An upfront "access fee" or an ongoing utility bill discount may be paid to the building owner. That 3rd party invests into money-saving, energy efficient opportunities. The 3rd party owns and operates that equipment to provide "energy services" to the building.[56]

Energy Services Agreement (ESA)					
Adapted for sectors:	Commercial	Public	Public rental housing	Private rental housing	Owner-occupied housing

[56] WEF. (2011). *A Profitable and Resource Efficient Future: Catalysing Retrofit Finance and Investing in Commercial Real Estate*. Retrieved from: http://www3.weforum.org/docs/WEF_IU_CatalysingRetrofitFinanceInvestingCommercialRealEstate_Report_2011.pdf

Energy Services Agreement (ESA)					
	+	+	+		
Led by:	Private sector				
Advantages	- Bilateral contract does not require new regulations - Overcomes some traditional EE barriers (eg. split incentives) - No capex for owner, aligns incentives of project developer, building owner and investor				
Weaknesses	- Limited scale to date - Fragmented market - 10 year contract period may limit 3rd party measures installed to low hanging fruits (high returns) - Increases transaction costs - Requires more developed skills on the client side - Lack of standardised framework and templates				
Main obstacles / legal changes required	- Education of building owners and project developers - Need for more pilots to help develop the market - Clarity on lease accounting and investors' rights in case of bankruptcy, tenant change or sale of host building				
Best practice examples	US providers such as Transcend Equity, Metrus Energy, Green City Finance, Abundant Power. UK example of Sustainable Development Capital LLP				

D. Connecting the Key Drivers with Specific Approaches

EEFIG members discussed and were able to connect some of the markets and policy-led approaches and the instruments identified in this chapter to some of the priority drivers of demand and supply of energy efficiency investments discussed in section 2. This analysis, shown in the following tables, provides the building blocks to develop a practical framework to stimulate energy efficiency investment in buildings:

Table 5: Key drivers for demand for energy efficiency investments and selected approaches and instruments

Demand Drivers	**Approaches and/or Instruments Proposed**	
Applicable to All Buildings Segments (Note: Key = "M" Markets-let; "P" Policy-led)		
Buildings Regulation, Building Certification and Energy Performance Certificates	• Mandatory building operational performance monitoring for sizeable energy users among commercial and public buildings;	P
	• Increase coherence, reliability, usefulness, ease of access and accuracy of mandatory Energy Performance Certificates delivering more useful and harmonised information for investors;	P/M
	• Better connect and input financial institutions needs to the energy performance certification process;	M
	• Consider mandatory "buildings passports" which contain all relevant building life cycle data for sizeable energy users among commercial and public buildings.	P
	• Develop Common Procedures and Underwriting Practice;	M

Standardization	• Clear investment protocols to covert national buildings roadmap vision into energy efficiency investments;	M
	• Increased flow of and standardized tenders for public buildings renovation;	P
	• Guidance and Education for Public sector buildings managers;	P
	• Development and dissemination of tool kits to asset owners and portfolio managers to elicit refurbishment demand.	M/P
Strong, Stable and Well-enforced Regulatory Framework	• Regulation should promote mandatory up-take of Energy Efficiency measures at key investment moments in a building's life-cycle;	P
	• Buildings operating performance measures and regulatory enforcement should be strengthened within Member States;	P
	• EC to act to promote Integrated Financial Reporting;	P
	• Regulation should focus on those who control refurbishment cycle of buildings and over buildings investments;	P
	• EU Investor Confidence project supporting standard processes and open-source energy database.	P/M
Tailored Financial Product Availability	• Demand for Finance is supported by the availability of the supply of appropriate finance products as sector stakeholders, installers and project developers (large and small) will hesitate to invest considerable resources to build a pipeline of energy efficiency projects where limited finance is available, or where the perception of funding risks are too high.	M
	• Support the further development of selected tailored financial instruments, such as: o Dedicated Credit Lines; o Risk sharing facilities; o Energy efficiency and sustainability approaches within Dedicated Real-Estate and Infrastructure Funds; o Energy Performance Contracting; o On-bill Repayments; o Green Bonds for Green Buildings.	M
Applicable Mainly to Commercial and Public Buildings		
Clear Business Case, Leadership and Awareness at Key Decision Maker Level	• Design formats for Comprehensive buildings operational energy performance database and "open source" energy usage data archive potentially using US models;	M
	• Implement Comprehensive buildings operational energy performance database and energy usage data archive potentially using US models;	P
	• Policy framework supports greater integration of sustainability risks into market fundamentals;	P
	• Public funds available for energy efficiency investments in line with National Buildings Renovation Strategies with a focus on cost optimal energy efficiency solutions.	P
	• EU Investor Confidence project supports standard processes and open-sourced buildings energy usage database;	M
	• Resolve privacy issues around energy related performance data;	P
Applicable Mainly to Public Buildings		

Rules on Public Authority Procurement, Accounting and Reporting	• Key decision makers and facilities managers must be responsible for energy use reduction;	M/P
	• Public Sector procurement Rules must be reviewed in light of the need to renovate Public Buildings at scale;	P
	• Public Authority Accounting should be reviewed to take a balanced view of the benefits as well as costs of energy efficiency investments in public buildings to be accounted for.	P
Facilitation/ Technical Assistance	• Monies to be invested to build and deliver investment pipelines, relevant data, education, training and more energy efficient renovation.	P

Table 6: Key drivers of supply for energy efficiency investments and selected approaches and instruments

Supply Drivers	**Instruments and Approaches Proposed**	
Applicable to All Buildings Segments (Note: Key = "M" Markets-let; "P" Policy-led)		
Standardization	• Standardise Energy Performance Contracts across Europe working with ESCOs and an agreed guidance process for MRV and legal documentation;	M
	• Mandatory training for procurement officers (with technical assistance where qualifying);	P/M
	• Consider specialized insurance coverage for reduction of financial risk and support the development of a secondary market for ESCOs.	M
	• EU Investor Confidence project supporting standard processes and open-source energy usage database.	M
Strong, Stable and Well-enforced Regulatory Framework	• Energy Efficiency to be a cornerstone of Europe's 2030 Climate and Energy framework leading to stable long-term framework at EU, national and regional levels;	P
	• Effective transposition of EU regulation (Art 4 on National Strategies and Articles 7 & 20 of EED);	P
	• Upgrade Buildings Regulation Enforcement with Frequent and thorough checks as deterrent;	P
	• Develop on-bill mechanism - through either of energy bills, tax bills or other relevant existing contracted payments (residential sector mainly);	P
Use of European Structural and Investment Funds 2014-2020 and Horizon 2020	• Can unlock investment supply through greater use of Risk sharing facilities by Managing Agencies in Operational Programmes;	P
	• Used in conjunction with, or to promote, dedicated credit lines, on-bill finance, the use of energy performance contracts and risk sharing facilities;	P
	• Emphasis on Technical Assistance to build and deliver investment pipelines, relevant data, education, training and more energy efficient renovation in public buildings;	P
	• Look to promote replicable energy efficiency refurbishment models in each sector through Horizon 2020 programme.	P
Applicable Mainly to Commercial and Public Buildings		

Increased Investor Confidence and Changes in Risk Perception	• Energy performance certificates and Green labels are of increasing use when they support "green value" (greater property value through energy efficiency);	M
	• Sustainability, Energy Efficiency and Carbon emissions should be fully integrated into the investment processes of Investment Managers and consultants;	M
	• Energy efficiency needs to be embedded in standard risk assessment methods, selection and monitoring processes;	M
	• Owners and lenders need better data for risk assessment, valuation of sustainability investments and for underwriting projects.	M/P
Measurement, Reporting & Verification (MRV) and Quality Assurance	• Clear, reliable and accountable MRV processes to be included in design of Common Procedures and Underwriting Practice;	M
	• Policy support to market organization and accreditation in support of high quality standards, best practice and transparency;	P
Applicable Mainly to Residential Buildings		
Simplicity and Reduced Transaction Costs	• Develop new, simple, easily accessible, low interest rate, tax efficient, retail energy efficiency offers is to be marketed widely through various trusted retail channels;	M/P
	• Implement a supportive fiscal regime designed to change homeowners' behaviour with respect of investing in the energy efficient refurbishment of their homes.	P

4. EEFIG Recommendations and Conclusions

A. What are the most imminent challenges to overcome?

EEFIG concludes its interim assessment of the drivers of energy efficiency investments and the approaches and instruments required to stimulate them with the strong sense that Europe is at a tipping-point. Energy efficiency investing has the clear potential to emerge into the mainstream as a key driver of competitiveness, economic value, innovation and employment across Europe. To achieve the deep energy efficient renovation of buildings in the EU, and deliver the multiple benefits which this brings, policy-makers and market participants need to work together to build upon the successful models which exist (permitting generalisation and expansion of these models across all of the EU), increase the market drivers and support selected instruments and approaches to scale-up energy efficiency investment activity in all Member States in order to allow for renovation rates and depths to grow quickly and significantly across the EU, while considering local, regional and national differences.

Emerging from EEFIG's interim analysis are several key themes which guide its recommendations as outlined in the final section of this chapter. These are:

1. **The full benefits[57] of energy efficient refurbishments of buildings must be captured and well-articulated, with evidence, and as a priority, to key financial decision makers (public authorities, buildings owners and managers and for householders)**: To achieve this EEFIG sees four requirements:
    a. The full benefits of energy efficiency investments (energy and non-energy related) must be identified, measured and presented for each refurbishment in ways in which key financial decision makers can understand and respond to; and the reporting and stakeholder frameworks in which key decision makers sit must be required to look more broadly[58] and account for more than just short-term energy savings;
    b. The necessary evidence and data must be easy to access and cost effective to compile and assess in investment decision making processes;
    c. Energy efficiency investments should be prioritized for key decision makers. Schemes like Australia's Energy Efficiency Improvement Scheme[59] or the UK's CRC Energy Efficiency Scheme[60] can cause large energy users to focus on energy savings, but there is no silver bullet;
    d. Internal procedures, reporting and accounting systems should be adapted so as not to additionally handicap viable energy efficiency investments.

2. **Processes and Standards for Energy Performance Certificates, Energy Codes and their Enforcement need to be strengthened and improved**: A step change in how energy efficiency potential is identified, measured, reported and verified is needed and achieving this is fundamental to unlocking the market at scale. The feedback from financial institutions and markets participants on the practicality and usefulness of existing energy performance

[57] Meaning Energy Savings, Productivity Increases, Health Benefits, Acoustic Benefits, Social and Environmental Benefits and the many other site specific multiple benefits of energy efficiency. IEA. (2012). *Spreading the Net: The Multiple Benefits of Energy Efficiency Improvements.* Retrieved from: http://www.iea.org/publications/insights/insightpublications/Spreading_the_Net_FINAL.pdf

[58] COM (2011) 681 final.

[59] Australian Government - Environment and Sustainable Development Directorate. (2014). *Energy Efficiency Improvement Scheme (EEIS)* [Website]. Retrieved from: http://www.environment.act.gov.au/energy/energy_efficiency_improvement_scheme_eeis

[60] UK Government. (2014). *Policy: Reducing demand for energy from industry, business and the public sector* [Website]. Retrieved from: https://www.gov.uk/government/policies/reducing-demand-for-energy-from-industry-businesses-and-the-public-sector--2/supporting-pages/crc-energy-efficiency-scheme

certificates in Member States should be reflected. The rapid and repeated process of connecting this input to improve and strengthen approaches should be a priority, as well as the practical and effective local enforcement of existing regulations, especially minimum performance standards upon upgrade, sale or rental.

3. **Making it easy to get the right data to the right decision makers**: There are too many hurdles between the relevant and credible data and the decision makers who need it; and the processes and resources required to extract that data and qualify it appear specialist and costly. For energy efficiency investments in buildings to enter the mainstream, it must be as easy for a key property decision maker to understand and value the benefits of those investments as it is for other comparable decisions. This means that adequate, accessible, dependable and sortable data on buildings and their real, measured and verified energy performance should be identified and made available to facilitate the preparation of energy efficiency investment cases. The data structures must clearly enable the connection and validation of value increases (in the broadest sense) with energy efficiency investments[61].

4. **Standards should be developed for each element in the energy efficiency investment process**: When a market is immature, high margins and competitive advantage may be available from tailored, one-off transactions. As markets develop, the commoditization of the low value-added documentation and processing part of the transaction increases customer confidence and adds volume to the market – allowing customers and solution providers to focus exclusively on the core elements of value: In this case, energy savings, green value and the other multiple benefits of buildings refurbishments. The standardization and adoption of best practice, standard national models for: Legal contracts, underwriting processes, procurement procedures, adjudication, measurement, verification, reporting, energy performance (contracts and certificates) and insurance; will add volume to the energy efficiency investment market and lower its costs of finance and transaction costs. The use of standardised MRV and legal documentation is particularly important to facilitate the bundling of investments for recycling to the bond market – creating a route to significant volumes of capital market finance. It would mutually reinforce the process of data collation and can also lead to national or regional "public knowledge centres" and experience hubs.

5. **Priority and appropriate use of EU Structural and Investment Funds and ETS revenues through public-private financial instruments from 2014-2020 will boost investment volumes and help accelerate the engagement of private sector finance through scaled risk-sharing**: The scale of finance needed to upgrade the building stock means this cannot be achieved by the private sector alone. As such public finance needs to be targeted to address specific market failures and risk share with the private sector. Scalable models and successful case studies of dedicated credit lines, risk sharing facilities and on-bill repayment schemes abound. Member States should be encouraged to move away from traditional grant funding and look more to identifying the working models which best address the energy efficiency refurbishment investment needs in their buildings (as articulated in their National Buildings Refurbishment Strategies). ESIF 2014-2020 funding (and other sources such as ETS revenues) will be required to kick-start and complement national energy efficiency funds (EED Art 20) and energy supplier obligations (Art 7) to deliver Europe's 2020 targets and National Buildings Renovation Strategies (Art 4). In this way opportunities for private finance to supplement public sector finance activity can be secured to maximise impact in

[61] Bullier, A., Sanchez, T., Le Teno, J. F., Carassus, J., Ernest, D., & Pancrazio, L. (2011). *Assessing green value: A key to investment in sustainable buildings.* Retrieved from: http://www.buildup.eu/sites/default/files/content/Assessing%20Green%20Value%20-%20Bullier,%20Sanchez,%20Le%20Teno,%20Carassus,%20Ernest%20and%20Pacrazio%20-%20ECEEE%202011.pdf

terms of number of buildings refurbished and increasing the private funds leveraged for every euro of public money invested.

B. EEFIG Conclusions and Recommendations to Policy Makers

EEFIG members, and their respective institutions, are convinced that the level of energy efficiency investment in Europe's buildings can, and should, increase dramatically from current levels with the right reforms in place to address persistent market failures. This will require concerted policy-led and markets-led activities which act on the drivers of energy efficiency investment supply and the demand for buildings refurbishment. Not only will this require a coherent and timely transposition of existing European framework legislation, as well as the strong enforcement of buildings regulations, but it will need the rapid scaling of working investment models across Member States together with an historic level of communication and co-activity.

To support and enable European policymakers to focus their resources on the most critical areas, EEFIG provides the following six priority areas for consideration:

1. **Existing Buildings Regulations should be fully implemented, harmonized and consistently enforced across EU Member States**: In the short-term, EEFIG members are confident that there is a significant amount of energy efficiency investment which can be unlocked by the ambitious transposition of the Energy Efficiency Directive, the Energy Performance of Buildings Directive, the stronger enforcement of buildings regulations (in particular the energy performance certification of buildings) by Member States and the smart use of Structural and Investment funds 2014-2020, and other sources, to deliver emissions reductions from energy efficiency outcomes;

2. **Future Regulatory Pathways for EU Buildings should provide concerted and consistent regulatory pressure to improve buildings efficiency**: Energy waste in buildings through inefficient design, inefficient use, inefficient systems, age, habit or inertia when cost effective refurbishment alternatives exist must be regulated out. Regulation balanced along with incentives should be used to ensure that over time the energy performance of buildings is increasingly priced into property sale or rental value. At the end of this period energy efficiency upgrades should be mandatory for those wishing to sell or rent a property (the role of energy performance certification needs to increase). It should be clearly signalled to those who wish to act in the near-term to refurbish buildings to high standards (above business as usual trends) that positive and incentives will be available (e.g. Fiscal benefits, soft loans supported by grant schemes where available etc.). For owners, waiting to refurbish wasteful buildings should be an increasingly uneconomic alternative and the inclusion of optimal energy efficiency measures in regular buildings renovations should be "market-standard" as a matter of course. The importance of leadership and signalling for energy efficiency investments should not be underestimated in the context of the EU's 2030 Climate and Energy package; the headline positioning of energy efficiency targets would impact how EU buildings' energy use will decrease and decarbonize from now until 2050 with intermediate milestones. If the EU wants to unlock the enormous potential for energy savings in its existing building stock then it clearly requires bold policy intervention going beyond the strong implementation of existing legislation;

3. **High quality decisions and low transaction costs can only be delivered by easily accessible data and standard procedures**: EEFIG has identified a series of best practice

initiatives focused on serving the need for better data on buildings energy performance[62] as well as the need to simplify and standardize the steps in the buildings energy efficiency investment process. In addition, EEFIG members note that the operational buildings energy consumption data recorded by smart meters and retained by energy suppliers in their public service capacity could be made available to customers, buildings owners, their advisors and accredited third parties in an anonymized way having resolved any legacy ownership or privacy issues. EEFIG supports the use of specific policy levers to drive cost effective energy efficiency investment decisions higher in the key decision-makers priorities, examples include: Energy Efficiency Improvement Scheme in Australia, the CRC energy efficiency scheme in the UK and minimum performance standards for EU buildings;

4. **Reporting, accounting and procurement procedures must facilitate, and not hinder, appropriate energy efficiency investments in public buildings**: The frameworks which motivate and guide public buildings managers must support the immediate prioritization of long-term, cost optimal energy efficiency refurbishments. The public accounting, reporting and procurement hurdles which prevent buildings mangers from making good quality, long-term decisions for their assets under management must be exposed and addressed as a priority. New procurement procedures, or special partial exemptions, for the energy efficient renovation of public buildings might be designed or considered in countries where existing frameworks are too cumbersome to adapt. If finance availability and/ or technical competence are issues then these should be addressed through increase technical assistance and use of supportive financial instruments in the context of the deployment of European Structural and Investment funds 2014-2020 and Horizon 2020;

5. **The "at-scale" energy efficiency upgrade of residential buildings can only happen with a concerted address of the specific investment demand and supply drivers of this segment and the engagement and alignment of retail distribution channels**: Homeowners are only likely to respond to a simple energy efficiency investment offer which has a clear value-proposition in the context of a well-signed long-term regulatory pathway for buildings energy efficiency. Initially, the strong alignment of interests among those entities with retail distribution networks (banks, energy companies, local government) is necessary along with facilitating mechanisms such as adapted, low cost measurement, reporting & verification and quality assurance, on-bill finance, fiscal benefits and long-term, low cost loans supported with risk-sharing mechanisms and tailored grant support for key communities. The high quality transposition of the Energy Efficiency obligations under article 7 of the Energy Efficiency Directive, and its links with Article 4, together with access to appropriate low, cost retail finance facilities and pipeline development assistance funding will support this segment. It is important to note that given the income distribution between and within countries there are some segments of the population for whom loans will never be appropriate and the public sector will need to substantially fund these refurbishments;

6. **The targeted address of energy efficiency investment supply and technical assistance through the smart deployment of Structural and Investment Funds 2014-2020 and Horizon 2020**: The smart combination of public and private funding sources can significantly increase the impact and amount of energy efficiency investments in buildings

[62] Sourced from:

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and deliver material emissions reductions whilst also delivering co-benefits such as job creation, health benefits, energy security etc., therefore making worthy use of public money. Public money should be used to lever private funding in support of energy efficiency investments which go beyond "business as usual", exceed the minimum energy efficiency requirement and regulatory standards or deliver significant long-lasting energy savings. EEFIG supports the layering-in of greater amounts of public support to reduce interest rates, provide public guarantees on energy efficiency investments and increase the attractiveness of more ambitious deep renovations through the increased use of dedicated credit lines and risk sharing facilities.

In conclusion, and in direct response to each of the six points above, EEFIG sees a natural opportunity for the European Commission to consider the following six actions:

1	Ensure the effective transposition of existing EU Directives and effective local enforcement procedures regarding the energy performance of buildings (including the performance certification) – potentially also increasing the Commission's internal buildings-specific resources for energy efficiency.
2	Deliver regulatory stability for energy efficiency investing in buildings through the provision of long-term regulatory pathway visibility, with respect of energy efficiency, and specifically in the context of the upcoming 2030 Climate and Energy package.
3	Address the need for high quality buildings performance data and standards through Commission support of best practice policies and initiatives within Member States and act to resolve collective issues such as the privacy and ownership questions for public-service or public funded energy data. In addition, the EU should consider the potential public roles in the provision and support of an "open-source" buildings energy data clearing-house and database to build the necessary market confidence in buildings performance.
4	Initiate a review and benchmarking process to better understand the decision making frameworks for public buildings owners, managers and their technical facilities staff with aims to remove accounting, reporting and procurement hurdles for investment in energy efficiency investments in, and create standard procurement procedures for, EU public buildings;
5	Benchmark and compare the relative successes of retail residential energy efficiency investment programmes in the Member States to ensure standards and best practice are promptly shared and replicated;
6	Ensure that Member States adequately identify the funding streams for their National Buildings Renovation Strategies (article 4 of Energy Efficiency Directive) with the proactive connection and consideration of the financial instruments available to support energy efficiency investments in buildings (including structural and investment funds 2014-2020, Horizon 2020, energy efficiency obligation schemes (Article 7) and funds coming from ETS revenues).

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6. Appendix

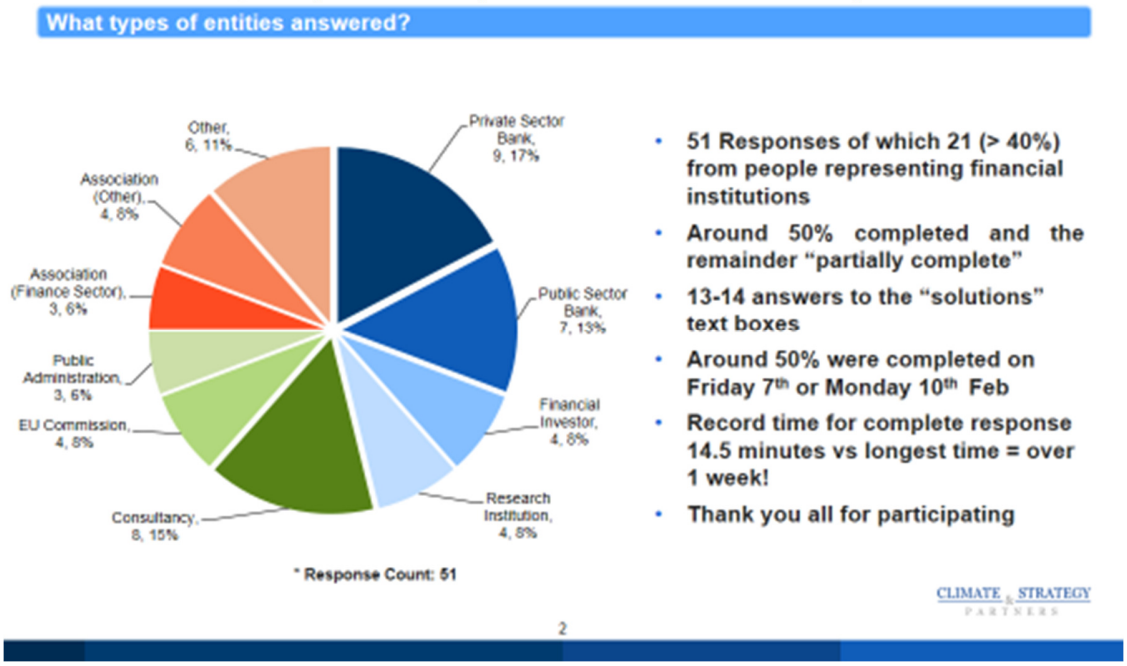
Full Methodology for EEFIG Relevant Driver Survey

EEFIG undertook a survey to add precision to a ranking exercise performed in its meeting hosted by the Commission on 22nd January 2014 where participants voted on the most important drivers for demand for and supply of finance for energy efficiency investments in the different buildings sectors.

The combined EEFIG input from the meeting, its extensive debate and "pin-board" results matrix were used to fill, design and pre-test an online survey. The result enabled EEFIG to make its interim report more precise and focused on these critical issues. The survey also allowed EEFIG members to highlight approaches and instruments as content to subsequent meetings.

The survey was just 3-pages in length which requested basic information from the user and then dealt with the demand drivers and then the supply drivers for energy efficiency investments in the different buildings sector segments, as discussed and agreed in the January EEFIG meeting. The survey allowed members to weigh the relative importance of each driver of energy efficiency investment demand or supply (in randomized order). Possible driver scores were from 1-6, where 6 was a "high" weighting (ie "one of the most important drivers") and 1 is a "low" weighting (ie "one of the least important drivers"). EEFIG members weighted each driver from 1 (low) to 6 (high) for each of the buildings segments separately: Commercial, Public, Owner Occupied Residential, Public Rental and Private Rental Residential buildings. If a driver was not applicable to a certain buildings segment then it could be left blank.

Chart: Response Summary for EEFIG Relevant Driver Survey 2014



Inert: Example page from EEFIG Survey 2014

EEFIG Relevant Issues Survey 2014

DEMAND for EE Finance in Buildings

This page is dedicated only to the factors which impact the DEMAND for energy efficiency finance in the various segments of the buildings sector.

Below you will see a list (in random order) of the "relevant issues" (as defined by the group) impacting the DEMAND for finance in buildings.

Your task is to weight each issue (or driver) from 1 (low) to 6 (high) for each of the buildings segments which we discussed: Commercial, Public, Owner Occupied Residential, Public Rental and Private Rental Residential buildings. If a driver is not applicable to a certain buildings segment you can just leave it un-ranked for that segment.

6. Please weight each DEMAND driver for EE Finance in each of the Buildings segments (1 is "low" and 6 is "high"):

	Commercial Buildings	Public Buildings	Owner Occupied Residential	Public Rental Residential	Private Rental Residential
Awareness at Key Decision Maker Level & Leadership	▼	▼	▼	▼	▼
Transaction costs / simplicity	▼	▼	▼	▼	▼
Definition and common understanding of the value of energy cost savings	▼	▼	▼	▼	▼
Fiscal Support	▼	▼	▼	▼	▼
Clear Business Case (including guaranteed savings)	▼	▼	▼	▼	▼
Rules on public authority accounting, procurement and reporting	▼	▼	▼	▼	▼